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FEDERAL COMMUNICATIONS COMMISSION

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Comments in Opposition to Notice of Proposed Rulemaking

In the matter of:

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Reallocation of 2390-2400)
and 2402-2417 MHz from)
Government to non-)
Government primary use)

ET Docket No. 94-32

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December 12, 1994

To the Commission:

1. INTRODUCTION

The frequency band from 2300 to 2450 MHz was for many years allocated to the Government on a primary basis, shared on a secondary basis with the Amateur Radio Service and in part shared with Industrial, Scientific, and Medical (ISM) devices. In a previous action, the Commission deleted 2310 through 2390 MHz from the Amateur Radio Service to protect aeronautical telemetry transmission in that subband. In the subject Docket, the Commission proposes, in response to the 1993 Omnibus Budget Reconciliation Act (OBRA), to limit or curtail Amateur Radio Service operations on 2390 through 2400 MHz, and from 2402 through 2417 MHz, and to remove these segments from a primary Government allocation and assign them to non-government users. The band from 2400 to 2402 MHz would become primary for the Amateur Service, and the segment from 2417 to 2450 MHz would be unaffected. These changes are based on a Preliminary Spectrum Reallocation Report, in which the National Telecommunications and Information Administration (NTIA) proposed to reallocate 35 MHz of the 70 MHz now available between 2300 and 2450 from Government to non-Government primary.

Amateur Radio operators currently use the use the frequencies under reallocation consideration for a number of purposes, including high speed digital communication, fast scan television, site linking for FM repeaters operating on the 2-meter, 222-225 MHz, and 70 cm Amateur Bands, weak signal operations, Earth-Moon-

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Earth (EME) transmissions, and experimentation. This operation, which is poised for explosive growth as the bands below 450 MHz become increasingly crowded, continues to be of scientific value as Amateurs "push the envelope" in long distance transmission with low power, and serves the public by facilitating better site-linking reliability on FM repeaters operating below 450 MHz. These repeaters are heavily used for public service and emergency communications.

It is the belief of the undersigned that displacement of Amateur Service operation from the 13 cm band at this time would have a negative long term impact on Amateur operations not only on 13 cm, but on the lower FM repeater bands as well, and that selection of alternative frequencies for non-Government operations would better serve the public. Specific reasons will be discussed below.

2. QUALIFICATIONS OF THE UNDERSIGNED

The undersigned is well qualified to comment in this matter, having held an Amateur Radio License and operated on 3.5 through 2400 MHz since 1953. He currently holds an Advanced class license, and has been active on Packet and Fast-Scan Amateur Television as well as CW, Single Sideband, and FM. He served on the American Radio Relay League (ARRL) VHF/UHF Advisory Committee from 1982 through 1993, and was chairman of that committee for two years. He is presently chairman of the ARRL Spectrum Management Committee.

He earned a Ph.D. in Electrical Engineering from the Johns Hopkins University, and has served on the faculty of that school as well as teaching Electrical Engineering courses for the Engineering Society of Baltimore. He has worked in the analysis and simulation of military weapons, including radio and radar propagation, for more than 30 years.

3. SPECIFIC RESPONSE TO THE DOCKET

Under the guidelines of the OBRA, it would be satisfactory for the Commission to meet reallocation obligations by surrendering bands where Government is primary and non-Government is secondary, provided that several conditions are met, among them that existing Amateur Radio use of the frequencies not be disrupted. OBRA specifically stipulates that excessive disruption of existing use of Federal Government uses by Amateur Radio licensees should be avoided, and the extent to which commercial users could share the frequencies with Amateur Radio licensees must be considered. OBRA further requires that bands selected for reallocation be those "that are most likely to have the greatest potential for productive uses and public benefits under the 1934 Act if allocated for nonfederal use." The undersigned does not believe that several relatively narrow segments from the 13 cm band, some of which are contaminated with Industrial, Scientific and Medical (ISM) noise,

satisfy this mandate.

In its own report to the Commerce Department in August of this year, the Commission recommended that changes be made to the NTIA proposals. Specifically, the report cited concerns in the Amateur Community that reallocation would indeed disrupt Amateur operation, and stated that NTIA had not met the requirement that the extent to which the bands could be shared with the Amateur Service be determined. A quote from that report is that "The largest factor affecting the future use of these bands is their existing availability for use by the Amateur Service."

The Commission, in 94-32, asks that comments be made in response to several questions. These are addressed below.

1. Will the recommended reallocation avoid excessive disruption of existing use of federal government frequencies by amateurs?

The NTIA has stated that "it is expected that the Amateur Community can satisfy the majority of their spectrum requirements in the remaining 35 MHz." In the same document, however, NTIA also states that 20 db extra power is needed to overcome ISM interference if the band above 2417 MHz were to be used for non-Government allocation. Even given the historic resourcefulness and ingenuity of Radio Amateurs, it is difficult to understand how, if this band is unsatisfactory for commercial purposes, it would satisfy the majority of the spectrum requirements of the Amateur Service.

The reallocation of frequencies below 20 GHz will in fact have a severe deleterious effect on the future of Amateur Radio. New RF devices are now becoming available that will, for the first time, allow economical widespread use of these frequencies by Amateur Radio operators. The concept of system networking is just now being utilized in the Amateur Service. Local repeaters with multiple receiver sites can use these frequencies for links, and packet operation is expanding to include local and long haul nodes. As an example, The Baltimore Radio Amateur Television Society has accomplished linking of sites for a 2-meter repeater using a 15 milliwatt system on 2306 MHz, with good reliability. Widespread use of similar link systems will take much pressure off the 420-450 MHz band, which has been experiencing serious crowding partly as a result of packet and link operations displaced from the former 220-222 MHz band. It is important to note that if these links are operated in the band 2417-2450 MHz instead of 2400 and below, an additional 20 dB will be required for the system to overcome ISM noise. Many repeater operators who might shift links from 70 cm to 13 cm would be deterred from doing so by the cost of this additional 20 dB. The 20 dB estimate for ISM noise was specified in the NTIA Preliminary Spectrum Reallocation Report, and is not simply conjecture on the part of the undersigned.

The frequency bands from 2300-2310 MHz and 2390-2450 MHz have a particular value to the Amateur Radio Service because they are the lowest frequencies where new broadband modulation schemes such as Spread Spectrum and Fast Scan Frequency Modulated Video communication can conveniently be accomplished. Without the 2.4 GHz band, it will be difficult for Amateurs to find space for modulation techniques which occupy 5 to 20 MHz per channel or more. The Amateur Radio Service is the only means for public access to vital spectrum suitable for spurring new and improved communications methods. Amateurs can build and experiment utilizing these new modulation techniques only where the allocated bandwidth permits.

As an example of new developments which will increase the use of the 13 cm band, a firm known as HF Technologies produces equipment for fast scan FM ATV for 2390 - 2450 MHz, with an output of about 1/2 watt. This product has the potential for turning this band into one which could potentially alleviate some overcrowding for wideband modes in lower frequencies. Loss of these frequencies to Amateurs would be detrimental not only to the businesses which are producing such equipment, but to the Amateur community as a whole.

2. Is the 2-MHz segment from 2400-2402 MHz that the Department of Commerce excluded from consideration from reallocation sufficient to avoid disrupting existing Amateur-Satellite operations?

The suggestion that 2 MHz would be sufficient for Amateur Satellite operations is based on a lack of understanding of the nature of worldwide satellite cooperative efforts. Uplinks and downlinks for satellite operation must, realistically, be on different spectral bands to avoid interference between transmitters and receivers. Because Amateur Satellites use low earth orbits, world wide coordination and allocations are needed, and the FCC proposal precludes this. As a minimum, ten MHz would be needed at 13 cm in order to match the 1260-1270 MHz uplink which is used throughout the world.

3. Will new nonfederal services in these bands be able to share the spectrum with existing services, especially with Amateur operations? If yes, what are the appropriate technical sharing criteria?

There is a real question as to whether nonfederal services can satisfactorily use these bands even without sharing with existing services. In their analysis of the NTIA suggestions, the Commission has already stated that the 2300-2310 and 2390-2400 MHz bands may prove too small to support new services. The Commission has also agreed that there is substantial likelihood that reallocation of 2300-2310 MHz and 2390-2400 MHz to commercial use could cause serious disruption to Amateur service use of these

bands. The Commission further stated that "Reallocation of the 2402-2417 MHz band presents little or no additional benefit to the public. This band is already used for non-Government services by the Amateur Radio community and Part 15 devices. Future changes to this band could jeopardize significant private sector investments"

Given that these obstacles could be overcome, the question as to whether sharing would be feasible, and with what technical standards, would probably be academic. Given a primary allocation for commercial operation, and secondary (with a non-interference requirement) for the Amateur service, the commercial user would in fact simply ask that Amateur operations be curtailed, as has been demonstrated in the case of some vehicle location proposals to the Commission.

4. SUMMARY

The Amateur Community has a rich heritage of being at the leading edge of communications technology. Currently it stands on the verge of a communications revolution in high speed data and video communication techniques occupying much greater spectral bandwidths. Today's Amateur should be allowed access to sufficient spectrum to allow the freedom to experiment and expand the horizons of the state of the art.

It has long been understood that many of the new innovations that eventually find their way into commercial radio (including direct broadcast satellite technology as an example) are first tried by Amateurs in the Amateur Service bands. If these frequencies are removed from the Amateur Service, there will be no place for this type of creativity.

The proposed reallocations are not in the best interest of the public, the Amateur Radio service, nor the commercial interests which they are intended to benefit. The bands involved are too narrow for most commercial purposes, parts of the bands are corrupted with ISM interference, the proposed Amateur Satellite subband is far too narrow, the loss of 13 cm would remove the only realistic spectrum for Amateur expansion and new techniques as the bands below 1300 MHz become more crowded, and experimentation on the cutting edge of the state of the art (where the public has always gained the most benefit from non-emergency Amateur activity) would be virtually eliminated.

For these reasons, it is requested that the Commission reconsider the proposed changes in ET 94-32.

Respectfully Submitted,

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